TITLE OF INVENTION

An efficient mechanism for trading multiple dissimilar products

CLAIM OF PRIORITY

This application claims priority under 35 U.S.C 119 (e) (1) from U.S. Provisional Patent Application No. 60/216,711, filed 07/07/2000.

CROSS-REFERENCE TO RELATED APPLICATIONS

1. Godin Paul B., Lymburner Jeffery *"Computer auction system"*, US Patent No. 5,890,138.
2. Ausubel Lawrence M., "*Computer implemented methods and apparatus for auctions*", US Patent No. 5,905,975
3. Hamdya A. Taha, *Operations Research – An Introduction*, Third Edition, Macmillan Publishing Co., Inc., New York.
4. *A Comparative Study of Optimization Techniques*, Optimization Technology – White paper, ILOG, Inc. Mountain View, CA.

STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT

Not applicable

REFERENCE TO A MICROFICHE APPENDIX

Not applicable

FIELD OF THE INVENTION

The present invention relates to online/computerized auction/bidding system and a method for carrying out an auction/bidding system where users access the auction/bidding system by remote computers through a computer network. Currently auctions/bidding systems provide participants to dispose or acquire only one particular type of product. The present invention provides a method and apparatus to dispose or acquire multiple dissimilar products.

BACKGROUND OF THE INVENTION

Auctions/bidding for sale of products, goods or services have proven to be very popular. Typically with auction/bidding systems, there is a possibility to obtain the product at a very competitive price. The standard ascending auction process involves users bidding for a particular product, and the product is sold to the highest bidder. The aim here is for

the seller of the product to sell at the maximum price. A product here in the present context means any product or goods or assets or service.

There is a variation of auction/bidding called the reverse auction. In this type of auction, a buyer posts his wish to buy or procure product or goods or services (this could be a Tender or Request for Proposal (RFP) or Request for Quote (RFQ) or any other term used for buying or procuring products). The sellers or providers of the products or goods or services then bid for it. In this type of auction/bidding the price of the bid generally decreases during the time period of the auction/bidding process. The aim of the buyer here is to buy or procure products at the lowest price.

There are also different types of auction/bidding systems: i) Open-bid and ii) Sealed-bid

i) Sealed-bid auction: In the standard sealed-bid auction, bidders--in one single bidding round--simultaneously and independently submit bids to the auctioneer, who then determines the auction outcome. The bids received are not shown to the other bidders. This type of auction/bidding processes does not provide any real time feedback. Buyers merely submit their bid, which is confidential.

ii) Open-bid auction: In an open-bid auction, bidders submit bids in real time until no more bids are forthcoming or a time is elapsed. An open-bid format offers the advantage that there is feedback between participants' bids: each bidder is able to infer other bidders' information about the value of the object(s) as the auction progresses and incorporate this information into his subsequent bids. This feedback tends to result in more efficient auction outcomes as well as more aggressive bidding, resulting in higher expected revenues for the seller in forward auction and a lowering of cost for the buyer in reverse auction. In open-bid, there is the excitement as the bids are displayed in real time and the participants can view the results in real-time.

There is another variation of the auction/bidding process where the seller or buyer specifies a reserve price. In the case of forward auction, the seller is going to sell the product only if the bid amount is greater than or equal to the reserve price otherwise the seller does not to sell the product. In the case of reverse auction, the buyer wants to buy the product only if the bid amount of the seller is less than or equal to the reserve price otherwise the buyer does not want to buy the product.

Most of the auctions/bidding systems provide participants to dispose or acquire only one particular type of product. The present invention provides a method and apparatus to dispose or acquire multiple dissimilar products.

BRIEF SUMMARY OF THE INVENTION

The present invention relates to trading of products in bundles. Traditionally trading occurs between two businesses on a product-by-product basis. A business may want to acquire or dispose (sell) a particular product or a portfolio of products. In either case,

individual transactions are consummated with respect to each of the products individually. However, in many situations, a market participant does not necessarily derive value for a single product, but for a basket of products. In such a circumstance, the acquisition or disposition of products on a product-by-product basis in order to obtain the basket of products in the right proportion, and at the right price, may prove to be mathematically complicated and time consuming task.

The market participant's problem is further exacerbated when the products are within different product classes. Here and throughout, the term product is used in its broadest sense. A product may be anything of value, and in a particular context, may be a commodity or other good, securities, or services, as well as money. In a similar vein, a business can mean any individual or a business or any entity that is trying to acquire or dispose products.

To illustrate the problem, consider a scenario where a business is trying to sell off excess inventory. The inventory might contain different product classes in different quantities. The business (seller in this case) wants to sell off this whole inventory. Traditionally, the business will opt for one of the two ways:

i) Seller will ask for bidders to submit bid for the whole lot. Seller will then select the highest bidder and sell the whole inventory to this highest bidder.

Or

ii) The seller will seek bids for each particular product class individually. The seller will then pick highest bids for each of these different product classes and sell them accordingly.

In either case, the market mechanism is not efficient.

Consider case i). Selling the whole lot as one piece might eliminate lot of buyers who might not have the resources to bid for the whole lot. Also, some buyers may be interested in buying some of the products and not the rest of the products, so they do not want to bid for the whole lot. But the bidder/buyer has no choice of choosing different products in this case.

Consider case ii). Selling the products individually may lead to potential loss for the seller as well as the buyer. Some buyers might need a group or a combination of products. To the buyer, this combination of products as a whole might be worth more than the worth of each of these individual products. Since in this case, there is no guarantee that the buyer will get all the products the buyer bid for (since the seller will pick highest bids for each of these individual products), the buyer is not guaranteed to get the combination of products that he bid. This might discourage those buyers to not place the bids, as the buyer is not guaranteed to get all the products that have been bid for. The buyer might get some products and not all the products the buyer bid. The buyer might be interested in all or none and so might end up with some products that might not be worth much to him.

In both the cases, this type of disposal of products eliminates those businesses that want to bid for a combination of different kinds of products. In both the cases, the seller and the buyer are at a disadvantage. For seller, the number of buyer pool is reduced thus limiting the bids. For buyers, the disadvantage is that the buyer has a limited choice.

The same analogy can be applied for businesses trying to acquire products. Generally businesses acquire products through Request for Proposal (RFP) or Request for Quotes (RFQ) or tenders. Regardless of the method used a method and apparatus is required which will let providers or sellers of the products to submit bids for a combination of products. This type of mechanism will result in a lower cost of acquiring products for the buyers and at the same time benefits seller as the seller can pick and choose the combination of products the seller wants to bid for.

Thus, there is a need in the art for a method and apparatus for implementing a mechanism by which a combination of products may be exchanged among market participants. For businesses trying to dispose products, this type of mechanism will result in higher revenue for the seller and at the same time satisfies the buyer. For businesses trying to acquire products, this type of mechanism will result in lowering the cost of procuring products and at the same time satisfies sellers.

BRIEF DESCRIPTION OF THE DRAWINGS

Preferred embodiments of the invention are shown in the drawings, wherein:

FIG.1 shows an overview of the system.

FIG. 2 shows the logical flow process of the optimization program

DETAILED DESCRIPTION OF THE INVENTION

FIG. 1 illustrates an overview of the system. With this system a hosts of users (buyers or sellers) access the server data processing system 104 through the client data processing system 101, 102, 103 etc. Although only three client data processing systems are shown connected to the server processing machine in FIG. 1, the server data processing machine can host many client data processing systems. The client data processing systems connect to server data processing system though networks.

The users enter their data through client processing machines 101, 102, 103 etc.. The users submit the data to server processing system 104. The server processing system 104 then stores the data into the database 106.

In case of sellers selling items, the seller enters the items to be sold, the time the bidding process expires and any other information like shipping and handling costs, tax or any other cost associated with the trade. Buyers access the server data processing machine 104 and bid for the items. Once the bid is submitted, the server processing machine 104 communicates the information to the optimization program 105. The optimization

program 105 then gathers all the data relevant to the data and starts processing to find the winning bids. The optimization program 105 updates the result into the database 106.

In case of buyers procuring items, the buyer enters the items to be sold, the time the bidding process expires and any other information like shipping and handling costs, tax or any other cost associated with the trade. Sellers access the server data processing system 104 and bid for the items. Once the bid is submitted, the server processing system 104 communicates the information to the optimization program 105. The optimization program 105 then gathers all the data relevant to the data and starts processing to find the winning bids. The software program updates the result into the database 106.

FIG. 2 shows the logical flow process of the optimization program 105 of FIG. 1. The program waits for the signal to start 201. Once the signal is received 202, it gets the relevant data from the database and starts to process or optimize the data 203 and calculates the winning bids. The results are then updated into the database 204.

EXAMPLE 1

For example, assume that a business wants to sell off excess inventory. The inventory consists of m items. Item 1 in Q_1 quantity, Item 2 in Q_2 quantity and Item 3 in Q_3.. .. Item m in Q_m quantity. The business is now asking for bids from potential buyers. This bid could be of any form like open-bid auction, sealed bid auction, dynamic bidding where market participants can update their bids real-time. Regardless of the type used, the seller is trying to maximize his revenue by selling the inventory. Once the bids are received, the seller has to decide which bids to accept. Assume the seller receives following bids:

Bid B_1 offering an amount of P_1 for items: Item 1 in Q_1^1 quantity, Item 2 in Q_2^1 quantity.....Item m in Q_m^1 quantity.

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Bid B_n offering an amount of P_n for items: Item 1 in Q_1^n quantity, Item 2 in Q_2^n quantity.....Item m in Q_m^n quantity.

It should be noted that quantity bid for each individual item i can be anything from zero (0) to quantity (Q_i) available for sale for that item. The seller wants to select bids that result in maximum revenue. This involves solving the following problem for:

Maximize: $P_1*Y_1 + P_2*Y_2 + \ldots\ldots P_n* Y_n$

Within constraints:

$$Q_1^1 + Q_1^2 + Q_1^3 + \ldots\ldots\ldots + Q_1^n <= Q_1$$
$$Q_2^1 + Q_2^2 + Q_2^3 + \ldots\ldots\ldots + Q_2^n <= Q_2$$

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$Q_m^1 + Q_m^2 + Q_m^3 + \ldots\ldots\ldots + Q_m^n <= Q_m$

Y_1 either 0 or 1
Y_2 either 0 or 1

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Y_n either 0 or 1

The above problem can be solved using any one of the optimization techniques like: linear programming, integer programming, domain reduction and constraint propagation, combinatorial optimization, genetic algorithms, simulated annealing or any other way for solving the problem that might be available. When for any n, if Yn is 1, it means the seller will select the bid n and Yn is zero (0) signifies that the bid n is not selected.

EXAMPLE 2

A similar scenario can be applied to business trying to acquire assets. Assume that a business wants to acquire or buy Item 1 in Q_1 quantity, Item 2 in Q_2 quantity and Item 3 in Q_3.. .. Item m in Q_m quantity. The buyer then asks for bids from potential sellers. The process of getting bids could be in any form like RFP, RFQ or tenders, it could be either offline or online, dynamic bidding where seller see all bids in real-time or could be a sealed bid or open-bid. Assume that the buyer has received following bids from seller:

Bid B_1 offering to sell at price of P_1 for items: Item 1 in Q_1^1 quantity, Item 2 in Q_2^1 quantity……Item m in Q_m^1 quantity.

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Bid B_n offering to sell at price of P_n for items: Item 1 in Q_1^n quantity, Item 2 in Q_2^n quantity……Item m in Q_m^n quantity.

It should be noted that quantity bid for each individual item i can be anything from zero (0) to quantity (Q_i) available for sale for that item. The buyer wants to select bids that result in minimum cost. This involves solving the following problem:

Minimize: $P_1*Y_1 + P_2*Y_2 + \ldots\ldots P_n* Y_n$

Within constraints:

$Q_1^1 + Q_1^2 + Q_1^3 + \ldots\ldots\ldots + Q_1^n >= Q_1$
$Q_2^1 + Q_2^2 + Q_2^3 + \ldots\ldots\ldots + Q_2^n >= Q_2$

.

.

$Q_m^1 + Q_m^2 + Q_m^3 + \ldots\ldots\ldots + Q_m^n >= Q_m$

Y_1 either 0 or 1
Y_2 either 0 or 1
.
.
Y_n either 0 or 1

Similarly, the above problem can be solved using any one of the optimization techniques like: linear programming, integer programming, domain reduction and constraint propagation, combinatorial optimization, genetic algorithms, simulated annealing or any other way for solving the problem that might be available. When for any n, if Yn is 1, it means the seller will select the bid n and Yn is zero (0) signifies that the bid n is not selected.

A variation to Example 2. involves solving the above problem:

Minimize: $P_1*Y_1 + P_2*Y_2 + \ldots\ldots P_n* Y_n$

Within constraints:

$Q_1^1 + Q_1^2 + Q_1^3 + \ldots\ldots\ldots + Q_1^n = Q_1$
$Q_2^1 + Q_2^2 + Q_2^3 + \ldots\ldots\ldots + Q_2^n = Q_2$
.
.
$Q_m^1 + Q_m^2 + Q_m^3 + \ldots\ldots\ldots + Q_m^n = Q_m$

Y_1 either 0 or 1
Y_2 either 0 or 1
.
.
Y_n either 0 or 1

In this case, the buyer wants to procure products only when he can get them in the exact quantity.

A further variation to the auction/bidding system can be accomplished by having a reserve price for the whole lot or items. That is, in the case of seller selling items, the winning bids will be chosen only when the sum of the bid amount of the winning bids is greater than or equal to the reserve price else no winning bids will be chosen. Similarly, in the case of buyer trying to procure items, the winning bids will be chosen only when the sum of the bid amount of the winning bids is less than or equal to the reserve price, else no winning bids will be chosen.